

U.S. Patent Application Serial No.: **09/664,332**  
Response filed November 5, 2010  
Reply to OA dated August 6, 2010

**AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claim 1 (Currently amended): An energy-ray curing resin composition comprising a photopolymerizable resin component which can be cured by irradiation with an energy ray, a photopolymerization initiator component which makes it possible to cure by chain reaction said photopolymerizable resin component with irradiation of an energy ray, and a curing agent component capable of curing at least one of said photopolymerizable resin components without irradiation of an energy ray,

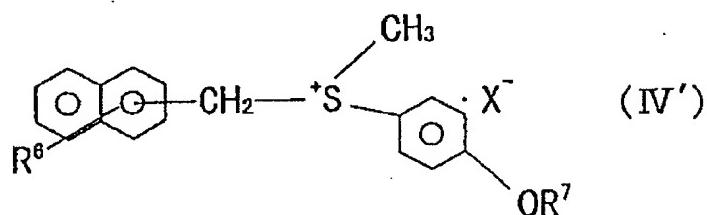
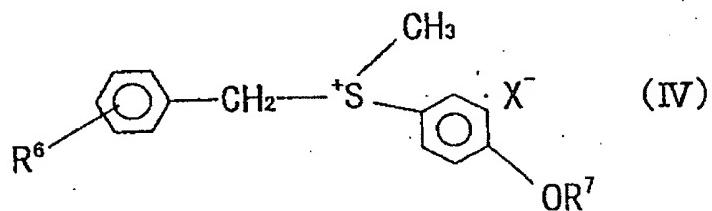
wherein the photopolymerizable resin component is an epoxy resin component having a cyclic ether structure in a molecular structure,

wherein said curing agent component comprises an acid anhydride,

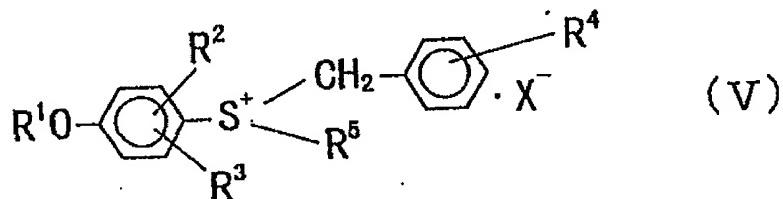
said photopolymerization initiator component comprises a sulfonium salt, the sulfonium salt being a photo-thermopolymerization initiator which can initiate polymerization by both of light and heat, and being represented by the following general formula (IV), (IV'), or (V):

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in Formula (IV) or (IV') described above, R<sup>6</sup> represents hydrogen, halogen, a nitro group or a methyl group; R<sup>7</sup> represent hydrogen, CH<sub>3</sub>CO, or CH<sub>3</sub>OCO; and X<sup>-</sup> represents SbF<sub>6</sub><sup>-</sup>, PF<sub>6</sub><sup>-</sup>, AsF<sub>6</sub><sup>-</sup> or BF<sub>4</sub><sup>-</sup>;



in Formula (V) described above, R<sup>1</sup> represents hydrogen, a methyl group, an acetyl group, or a methoxycarbonyl group; R<sup>2</sup> and R<sup>3</sup> each independently represent hydrogen, halogen or an alkyl group of C<sub>1</sub> to C<sub>4</sub>; R<sup>4</sup> represents hydrogen, halogen or a methoxy group; R<sup>5</sup> represents an alkyl group of C<sub>1</sub> to C<sub>4</sub>; and x represents SbF<sub>6</sub><sup>-</sup>, PF<sub>6</sub><sup>-</sup>, AsF<sub>6</sub><sup>-</sup> or BF<sub>4</sub><sup>-</sup>, and

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wherein said curing agent component is present with a proportion of 0.3 to 1.4 mol per mol of said photopolymerizable resin component which can react with said curing agent component,

wherein said photopolymerization initiator component is present with a proportion of 0.1 to 6.0 parts by weight per 100 parts by weight of the whole weight of the other components than the photopolymerization initiator component,

wherein the polymerization initiator component comprises a binary or higher system containing the photo-thermopolymerization initiator in a proportion of 10 to 100% by weight.

Claim 2 (Original): The energy-ray curing resin composition as described in claim 1, further comprising a curing accelerator component which accelerates curing when curing at least one of said photopolymerizable resin components and said curing agent component without irradiation of an energy ray.

Claims 3-5 (Canceled).

Claim 6 (Previously Presented): The energy-ray curing resin composition as described in claim 2, comprising a monohydric or polyhydric alcohol as the curing accelerator component.

Claim 7 (Currently amended): The energy-ray curing resin composition as described in claim [[3]] 1, wherein said curing accelerator component comprises a compound which can react

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with the epoxy resin component and which does not have a nitrogen atom in a molecular structure.

Claim 8 (Currently amended): The energy-ray curing resin composition as described in claim [[3]] 1, comprising 3,4-epoxycyclohexylmethyl-3,4-epoxycyclohexanecarboxylate as the photopolymerizable resin component.

Claim 9 (Canceled).

Claim 10 (Previously Presented): The energy-ray curing resin composition as described in claim 6, comprising polyethylene glycol as the alcohols.

Claim 11 (Canceled).

Claim 12 (Previously Presented): The energy-ray curing resin composition as described in claim 2, wherein the curing accelerator component is present with a proportion of 0.04 to 0.6 mol per mol of the curing agent composition.

Claims 13-21 (Canceled).

Claim 22 (Previously Presented): A paste material comprising the energy-ray curing resin composition as described in claim 1.

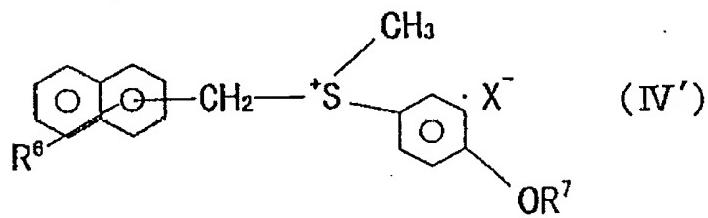
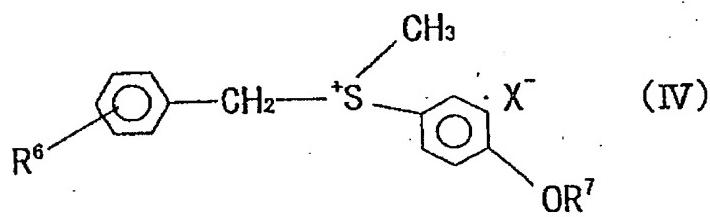
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Claims 23-26 (Canceled).

Claim 27 (Currently amended): A composition for an energy-ray curing resin-molded article comprising a photopolymerizable resin component which can be cured by irradiation with an energy ray, a photopolymerization initiator component which makes it possible to cure said photopolymerizable resin component with irradiation of an energy ray, and a curing agent component capable of curing at least one of said photopolymerizable resin components without irradiation of an energy ray,

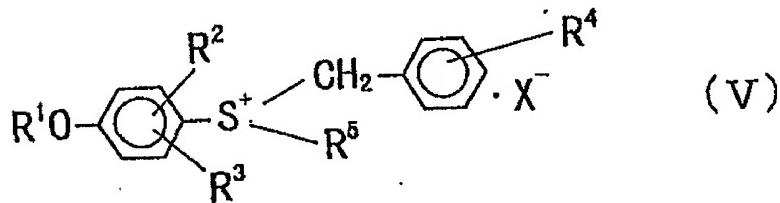
wherein said curing agent component comprises an acid anhydride or a derivative thereof, said photopolymerization initiator component comprises a sulfonium salt, the sulfonium salt being a photo-thermopolymerization initiator which can initiate polymerization by both of light and heat, and being represented by the following general formula (IV), (IV'), or (V):



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in Formula (IV) or (IV') described above, R<sup>6</sup> represents hydrogen, halogen, a nitro group or a methyl group; R<sup>7</sup> represents hydrogen, CH<sub>3</sub>CO, or CH<sub>3</sub>OCO; and X<sup>-</sup> represents SbF<sub>6</sub><sup>-</sup>, PF<sub>6</sub><sup>-</sup>, AsF<sub>6</sub><sup>-</sup> or BF<sub>4</sub><sup>-</sup>;



in Formula (V) described above, R<sup>1</sup> represents hydrogen, a methyl group, an acetyl group, or a methoxycarbonyl group; R<sup>2</sup> and R<sup>3</sup> each independently represent hydrogen, halogen or an alkyl group of C<sub>1</sub> to C<sub>4</sub>; R<sup>4</sup> represents hydrogen, halogen or a methoxy group; R represents an alkyl group of C<sub>1</sub> to C<sub>4</sub>; and x represents SbF<sub>6</sub><sup>-</sup>, PF<sub>6</sub><sup>-</sup>, AsF<sub>6</sub><sup>-</sup> or BF<sub>4</sub><sup>-</sup>;

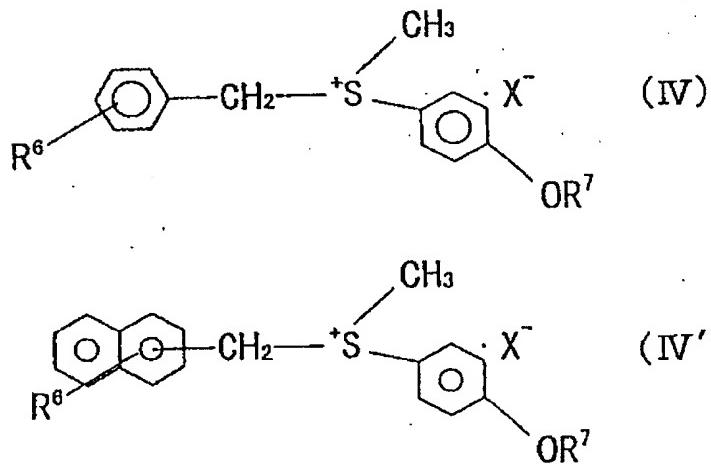
wherein said curing agent component is present with a proportion of 0.3 to 1.4 mol per mol of said photopolymerizable resin component which can react with said curing agent component,

wherein said photopolymerization initiator component is present with a proportion of 0.1 to 6.0 parts by weight per 100 parts by weight of the whole weight of the other components than the photopolymerization initiator component,

wherein the polymerization initiator component comprises a binary or higher system containing the photo-thermopolymerization initiator in a proportion of 10 to 100% by weight.

Claim 28 (Currently Amended): An energy-ray curing resin composition for a paste material comprising a photopolymerizable resin component which can be cured by irradiation with an energy ray, a photopolymerization initiator component which makes it possible to cure said photopolymerizable resin component with irradiation of an energy ray, and a curing agent component capable of curing at least one of said photopolymerizable resin components without irradiation of an energy ray,

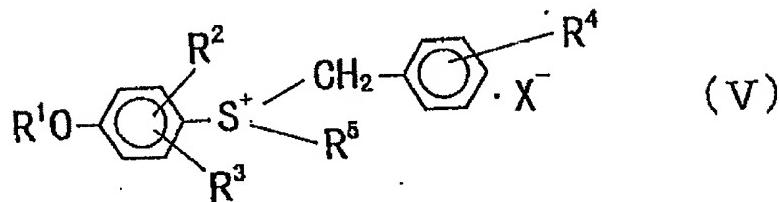
wherein said curing agent component comprises an acid anhydride or a derivative thereof, said photopolymerization initiator component comprises a sulfonium salt, the sulfonium salt being a photo-thermopolymerization initiator which can initiate polymerization by both of light and heat, and being represented by the following general formula (IV), (IV'), or (V):



in Formula (IV) or (IV') described above,  $\text{R}^6$  represents hydrogen, halogen, a nitro group or a methyl group;  $\text{R}^7$  represents hydrogen,  $\text{CH}_3\text{CO}$ , or  $\text{CH}_3\text{OCO}$ ; and  $\text{X}^-$  represents  $\text{SbF}_6^-$ ,  $\text{PF}_6^-$ ,  $\text{AsF}_6^-$  or  $\text{BF}_4^-$ ;

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in Formula (V) described above,  $\text{R}^1$  represents hydrogen, a methyl group, an acetyl group, or a methoxycarbonyl group;  $\text{R}^2$  and  $\text{R}^3$  each independently represent hydrogen, halogen or an alkyl group of  $\text{C}_1$  to  $\text{C}_4$ ;  $\text{R}^4$  represents hydrogen, halogen or a methoxy group;  $\text{R}^5$  represents an alkyl group of  $\text{C}_1$  to  $\text{C}_4$ ; and  $\text{x}$  represents  $\text{SbF}_6^-$ ,  $\text{PF}_6^-$ ,  $\text{AsF}_6^-$  or  $\text{BF}_4^-$ ;

wherein said curing agent component is present with a proportion of 0.3 to 1.4 mol per mol of said photopolymerizable resin component which can react with said curing agent component,

wherein said photopolymerization initiator component is present with a proportion of 0.1 to 6.0 parts by weight per 100 parts by weight of the whole weight of the other components than the photopolymerization initiator component,

wherein the polymerization initiator component comprises a binary or higher system containing the photo-thermopolymerization initiator in a proportion of 10 to 100% by weight.

Claim 29 (New): The energy-ray curing resin composition as described in claim 1,

wherein the polymerization initiator component comprising the binary or higher system contains the photo-thermopolymerization initiator in a proportion of 50 to 80% by weight.